

CHAPTER 5 RECYCLED WATER PROGRAM

5.1 OVERVIEW

IEUA, an ex-officio member of the CDA and a Regional agency responsible for wastewater treatment, has organized a program to encourage water reuse within its service area and the adjacent JCSD service area. The Cities of Corona and Norco are responsible for water recycling in their service areas. The establishment of new supplemental funding sources through federal, state and regional programs now provides significant financial incentives for local agencies of the CDA to use recycled water. While the CDA as an agency does not provide or distribute recycled water, recycled water is an important element of the water supply portfolios of the CDA retail agencies. The primary water supply for population growth associated with the conversion of agricultural land to urban uses in the southern part of the Chino Basin will come from either recycled water or reclaimed groundwater distributed by the CDA.

In July 2008 WMWD adopted its “Western Strategic Plan” to respond to on-going water resource issues in southern California. Out of seven policy statements developed in the plan, Policy 1 is to “Implement a diversified water supply portfolio in the region.” A key action item for this policy is full utilization of the recycled water produced in Western’s retail and/or wholesale areas and to dramatically reduce the use of potable water for outdoor areas. To help achieve this, WMWD prepared a Recycled Water Master Plan in December 2009.

The Chino Basin Groundwater Recharge Program is required by the Peace Agreement and it is an integral part of the Watermaster’s Optimum Basin Management Plan. This comprehensive program aims to enhance water supply reliability and improve the groundwater quality of local drinking water throughout the Chino Basin by increasing the recharge of storm water, imported water and recycled water.

5.2 IEUA’S REGIONAL RECYCLED WATER PROGRAM

IEUA continues to work closely with the CDA retail agencies to develop and implement the regional recycled water distribution program that maximizes water reuse in the Chino Basin. The 2002 Feasibility Study, 2005 Implementation Plan and the Recycled Water Three Year Business plan included a market assessment of the potential recycled water customers within the IEUA service area. Working with the cities and retail water agencies over 2,300 potential customers were identified. This information was used to plan the regional and local recycled water distribution pipelines. Pipeline locations were selected to provide recycled water to the largest customers or groups of customers. Ultimately, the distribution system will serve over 1,900 of the largest customers and an

overall supply of approximately 104,000 AFY, which includes a large portion for groundwater recharge in the Chino Basin.

IEUA'S HISTORICAL RECYCLED WATER DISTRIBUTION SYSTEM

Beginning in the early 1990's IEUA began the construction of the first phase of the Carbon Canyon Recycled Water Project (CCRWP) which included treatment facilities and distribution pipelines to serve customers in Chino and Chino Hills. In conjunction with the construction of the first phase of the CCRWP, IEUA began planning for a regional recycled water delivery system to provide recycled water throughout its service area. This planning effort culminated with the completion of the IEUA Regional Recycled Water Program Feasibility Study in January 2002. The Feasibility Study identified facilities to deliver over 70,000 acre-feet of recycled water per year (AFY) to customers and recharge sites throughout the IEUA service area.

In 2004 IEUA developed a regional recycled water program implementation plan to prioritize the phased construction of the adopted 2002 Recycled Water Program Feasibility Study.

This major planning effort resulted in the completion of the 2005 Recycled Water Implementation Plan (RWIP). The RWIP identified projects to deliver recycled water of approximately 93,000 AFY utilizing an interconnected distribution pipeline system supplied from all four of IEUA's major recycled water plants.

In 2007, IEUA developed the Recycled Water Three Year Business Plan. The Business Plan is intended to guide the expansion of the IEUA recycled water system. The Plan focused on the most cost effective and rapid ways to increase the amount of recycled water available and used within IEUA's service area. The Plan is intended to focus on the following three years and would be revised and updated on an annual basis. Metrics and an annual usage goal were identified for each year. Table 5-1 shows the goals of the Recycled Water Three Year Business Plan.

Table 5-1
Recycled Water Three Year Business Plan
Annual Goals for Connected Demand and Sales

Year		Connected Demand	Increase		Estimated Sales*
		AFY	AFY	%	AFY
Base Year	2006/07	13,000		---	---
1	2007/08	17,600	4,600	135%	13,500
2	2008/09	27,034	14,034	208%	16,000
3	2009/10	36,000	13,000	277%	32,000*
4	2010/11	45,000	32,000	346%	40,000*
5	2011/12	50,000	37,000	385%	45,000*

*Estimated sales lag connections.

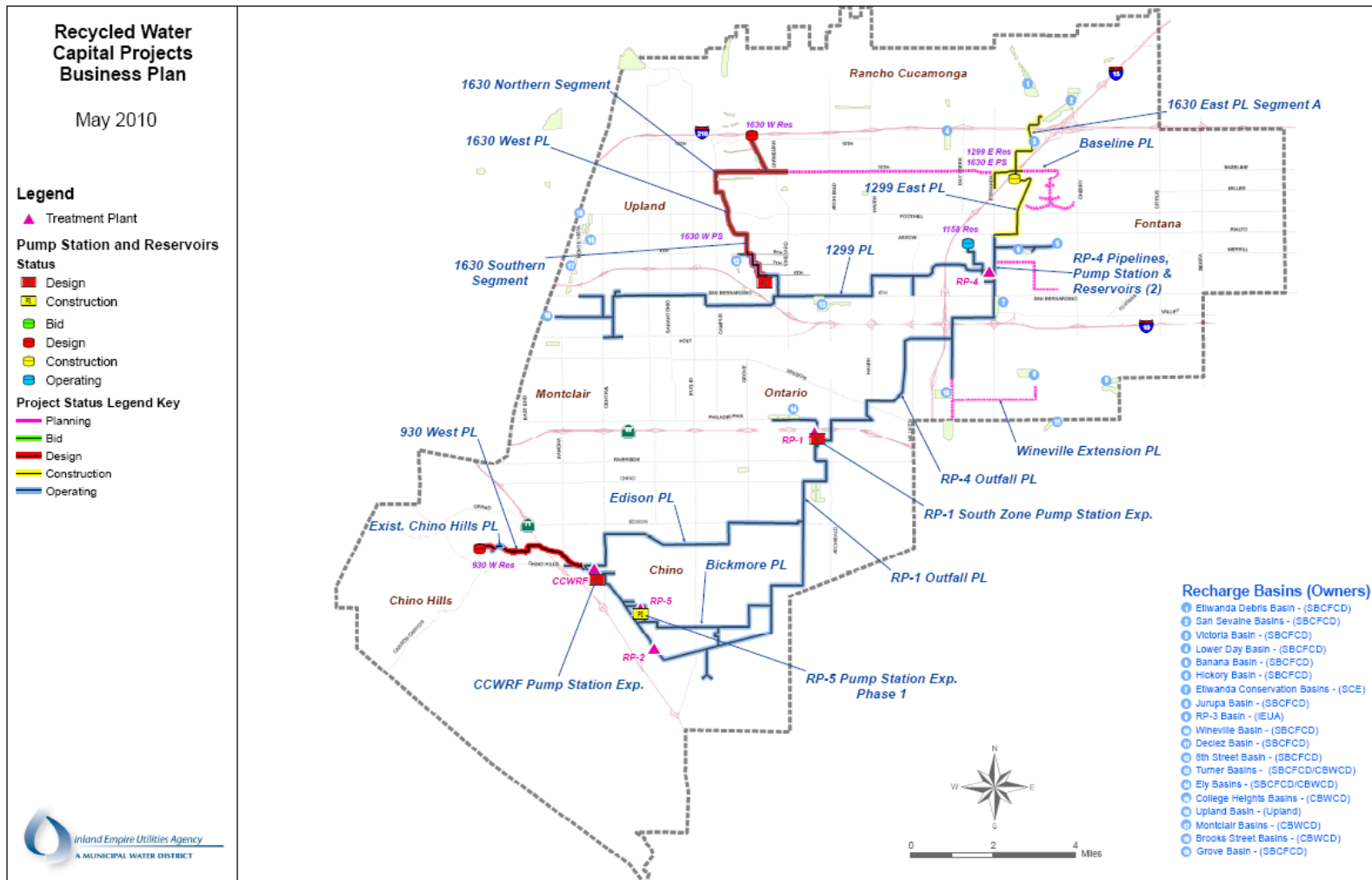
RECYCLED WATER USAGE IN THE CHINO BASIN

Available recycled water supplies are projected to reach approximately 83,000 AFY in 2035. In conformance with the 1969 Santa Ana River Judgment, a minimum of approximately 17,000 AFY of water will be discharged to the Santa Ana River. This leaves more than 66,000 AFY of recycled water available for beneficial reuse within the IEUA service area by 2035.

IEUA's overall goal is to achieve maximum reuse of all available recycled water. In the short term, the primary focus of IEUA's recycled water program will be the connection of industrial and landscape customers and development of facilities to ensure cost-effective delivery of recycled water to groundwater recharge spreading sites. In the long term, IEUA seeks to construct a "looped" distribution system that will interconnect IEUA water reclamation plants, ensure direct supply reliability to customers and maximize the flexibility to recharge all surplus recycled water in flood control spreading grounds.

The current distribution system is comprised of several regional pipelines that have been constructed to serve IEUA's wastewater treatment plants. Recognizing that separate pumping stations, independent pressure zones (800', 930', 1050', 1158, 1299' & 1670) , and multiple control interfaces will ultimately lead to overly complex and costly operations, the concept of a large, fully integrated (regional) distribution system was developed. As shown in Figure 5-1, the existing and proposed facilities will provide the ability to provide recycled water to major industrial and municipal users while delivering recycled water, storm water and imported water to groundwater recharge basins throughout IEUA's service area.

**Figure 5-1
Recycled Water Distribution Lines and Regional Plants**



Recycled water used for groundwater recharge will be blended with MWD's imported SWP supplies and local storm water, consistent with the water quality requirements of the Chino Basin Watermaster's Optimum Basin Management Plan, Santa Ana Regional Water Quality Control Board's Basin Plan and the requirements of the State of California Department of Public Health (CDPH) requirements.

Depending on basin specific measurements, up-gradient ground water migration data the blending ratio will be calculated to achieve up to 50% with all other sources of water as determined by CDPH over a 10 year period. Currently IEUA can recharge 14,000 Acre-feet per year as more basins are connected to recycled water and the underflow calculation is formalized more recycled water will be recharged. Additional facilities, including the development/modifications of new groundwater recharge basins, and installation of additional pumping capacity, will be needed to achieve the long term water recycling goals for the region. As more and more direct use customers are connected ground water recharge will be operated to ensure availability for direct reuse.

Development of local recycled water facilities will be the key to expanding the direct use of recycled water. Direct uses include irrigation for landscaping, industrial process and cooling, and recreational uses such as decorative fountains. As the recycled water facilities expand for the first time into cities such as Fontana and Upland, IEUA will be looking to the local water providers to construct sufficient recycled water facilities that will reduce their dependence on imported water from MWD's Rialto Feeder.

All future direct use (landscape and industrial customers) of recycled water will be given priority service over recharge deliveries. Recharge will be credited based upon the annual flow contributions for all contracting agencies on a pro-rata basis.

Table 5-2 provides projections for total regional recycled water usage between 2015 and 2035.

Table 5-2
Potential Recycled Water Supply

Regional Plants	Year 2015		Year 2020		Year 2025		Year 2030		Year 2035	
	Plant Capacity (MGD)	Plant Flow (MGD)	Plant Capacity (MGD)	Plant Flow (MGD)	Plant Capacity (MGD)	Plant Flow (MGD)	Plant Capacity (MGD)	Plant Flow (MGD)	Plant Capacity (MGD)	Plant Flow (MGD)
CCWRF	11.4	7.5	11.4	8.6	11.4	9.3	11.4	10.1	11.4	10.8
RP-1	44.0	29.6	44.0	30.1	44.0	31.0	44.0	32.5	44.0	34.0
RP-4	14.0	11.5	14.0	12.6	14.0	13.8	14.0	13.9	14.0	13.8
RP-5	16.3	10.5	16.3	11.6	16.3	12.3	16.3	13.9	16.3	15.9
Total	85.7	59.1	85.7	62.9	85.7	66.4	85.7	70.4	85.7	74.5

In order to deliver the ultimate demand for recycled water additional regional pipelines, reservoirs, booster stations, and land parcels will be required. (see IEUA's 2010 UWMP Chapter 6 and 7 for more details.)

FUNDING

Implementation of the Regional Recycled Water Program has been coordinated with the availability of state and federal funds to minimize use of regional capital funds. IEUA has adopted a Ten-Year Capital Improvement Plan (CIP) which has a budget that breaks out the federal, state and local funding for recycled water project over the next ten years. Local funding will be through the Regional Capital Fund, State grants and loans through DWR and the State Water Resources Control Board, and Federal grant funding through the US Bureau of Reclamation's Title XVI program.

Capital funding needs for the Regional Recycled Water Distribution System are estimated at \$101.5 million over the next ten years. This includes grant funding from California's Proposition 13--Santa Ana River Watershed Funds (\$19 million awarded in 2000 for Phase I, additional funds were sought for remaining projects), California's Proposition 13--State Water Resources Control Board water recycling grant program (\$15-\$20 million, applications pending), and the U.S. Bureau of Reclamation Title XVI Grants (\$20 million for water recycling and \$50 million for construction of desalters, Congressional authorization pending).

As more supplemental funding becomes available, the recycled water infrastructure becomes more cost-effective to construct. IEUA staff evaluated the capital funding needs for the Recycled Water Distribution System and determined that it can be funded through the Regional Program without an additional increase in the Regional Capital Capacity Reimbursement Amount (connection fee). This provides a significant opportunity for local retail agencies to implement the OBMP (capital costs) without impacting IEUA's water and sewer rates and charges.

Repayment of the various loans will occur through recycled water sales revenues. These revenues consist of sales of recycled water (current IEUA wholesale rate of \$75/ AF for direct deliveries and \$85/AF for groundwater recharge and through the MWD Local Resources Program (LRP). With certain contractual limitations, MWD provides a payment of \$154 for each acre-foot of recycled water that is directly reused (not groundwater recharge) up to 13,500 AF cap.

ENCOURAGING RECYCLED WATER USE

IEUA has organized a regional program to encourage water reuse within its service area. The establishment of new supplemental funding sources through federal, state and regional programs now provides significant financial incentives for local agencies to

develop and make use of recycled water. This will remove a significant obstacle to the implementation of recycling water projects and programs.

IEUA is working closely with its local retail agencies to complete the regional recycled water distribution program that will maximize water reuse for the entire IEUA service area. Staff of all the agencies meets monthly to coordinate the master planning of the recycled water system to ensure that optimal capital investments are prioritized and that all potential customers are contacted regarding connection to the recycled water system. IEUA is also working with local retail agencies to ensure that all new residential, commercial and industrial developments have dual plumbing so that recycled water (when available) can be used for outdoor irrigation and other non-potable water uses.

In addition, IEUA has proposed the following incentives to encourage the use of recycled water. These include the following:

- A discount for Non-Reclaimable Water service users (to promote removal of salts from the groundwater basin);
- Shared costs for service connections, water meters, and signage;
- Loans to help finance local (non-regional) infrastructure and retrofit projects that contribute to use of recycled water;
- Technical assistance with engineering, regulatory and institutional issues and with preparation of funding applications;
- Guarantee of recycled water supply reliability, especially during droughts.

5.3 WMWD'S RECYCLED WATER PROGRAM

POTENTIAL SOURCES OF RECYCLED WASTEWATER

Wastewater Treatment Facilities

Western's Lake Mathews retail service area receives wastewater treatment services from:

- the Western Water Recycling Facility (formerly the March Wastewater Treatment Plant) operated by Western;
- the Western Riverside County Regional Wastewater Treatment Plant (WRCRWTP) operated by Western;
- the City of Riverside at the Riverside Water Quality Control Plant; and
- individual septic treatment systems.

The WRCRWTP plant, a tertiary facility capable of providing reclamation water for reuse or for discharge through an outfall to the Santa Ana River, was brought online in 1998. It has a design capacity for eight MGD with the capability for expansion to 32 MGD. This facility performs high levels of treatment through a number of consecutive wastewater treatment processes. Wastewater from Western's retail and wholesale customers, the City of Norco, Jurupa Community Services District and Home Gardens Community Services District is collected through many miles of pipelines, pumped to the treatment plant, processed and discharged into the Santa Ana River. The average flow into the plant in December 2010 was 6.6 MGD and on some storm days flows were nearly 8 MGD. There are immediate plans to expand the WRCRWTP up to 12 MGD. Currently the plant treats and discharges approximately 5,000 AFY to the Santa Ana River (SAWPA 2010). Treated wastewater discharged into the Santa Ana River in San Bernardino and Riverside Counties, such as that from the WRCRWTP, is subsequently put to use by Orange County Water District. Except during periods of high storm flow, Orange County Water District recharges all the flow in the Santa Ana River using surface recharge basins in Anaheim and Orange. The WRCRWTP is in the final planning stages of providing recycled water to the City of Norco. To date, seven miles of or recycled water pipeline a small reservoir and a pump station have been installed and in the near future the City of Norco is anticipated to take delivery of up to 895 AFY of recycled water.

Western Water Recycling Facility treats domestic wastewater from the former March Air Reserve Base and the north central portion of the Lake Mathews service area. Currently, the plant produces about 1 MGD (about 560 AFY) of "secondary" treated wastewater which is discharged to a storage pond and then pumped to supply reclaimed water to the Riverside National Cemetery and General Old Golf Course, which are currently the only users of reclaimed water from the Plant (SAWPA 2010, Western 2009). When supply exceeds demand, such as during wet winter months, the reclaimed water is stored in the on-site pond until needed. If there is a large discrepancy between recycled water demand and recycled water supply. Excess recycled water from the Western Water Recycling Facility could be placed in Western's existing sewer collection system for conveyance and treatment at the WRCRWTP and eventual discharged to the Santa Ana River.

Western recently completed improvements to the plant to allow treatment up to a tertiary level and to increase capacity to 3 MGD. The purpose of the expansion is to serve new residential development to the west of the facility and a major industrial development to the north. The amount of influent to the Western Water Recycling Facility and new demand for recycled water is dependent on new development in the Lake Mathews service area. Table 4-2 illustrates the anticipated treatment capacity and Average Daily Flow for the Western Water Recycling Facility. Table 5-3 is based on data provided in Western's Recycled Water Master Plan. The plan assumed that wastewater volumes would increase by approximately 3.3% per year. Commercial and residential wastewater volumes are expected to reach 3,780 AF in 2030.

Table 5-3
Western Water Recycling Facility Wastewater Treatment Capacity
and Anticipated Volumes

Year	Treatment Capacity (MGD)			Anticipated Average Daily Flow (MGD)		
	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary
2010	3	3	3	0.6	0.6	0.6
2015	3	3	3	1.3	1.3	1.3
2020	3	3	3	1.3	1.3	1.3
2025	5	5	5	2.7	2.7	2.7
2030	5	5	5	3.6	3.6	3.6
2035	5	5	5	3.6	3.6	3.6
<i>Source: Western 2009.</i>						

RECYCLED WATER DEMAND

Current Use

Currently Western delivers secondary treated wastewater, approximately 1,066 AFY, to Riverside National Cemetery and the General Old Golf course. In 2005 Western delivered approximately 450 AFY of secondary treated wastewater and delivered no water treated to tertiary standards.

Potential Users

In addition to future sales of recycled water to the City of Norco, Western has identified over 5,800 AFY of potential recycled water demand in the vicinity of the Western Water Recycling Facility from existing non-potable water customers. However that represents the greatest potential demand. Western also examined existing non-potable water customers in the retail area who consumed more than 40 AFY. The analysis was limited to larger (40 AFY or larger) consumers due to the cost of extending recycled water lines and because maintaining a recycled water system requires some customer sophistication. Western identified nearly 2,786 AF of demand from existing larger non-potable customers. Future development is anticipated to bring another 2,157 AF of recycled water demand. In total, existing and future recycled water demand is anticipated to be nearly 5,000 AFY (Western 2009). Table 5-4 provides estimates of recycled water by customer type, both existing and future. Table 5-5 provides projections of recycled water production and use.

Table 5-4
Estimates of Recycled Water Demand by Customer Type –
Western Retail Service Area

Type of Use	Existing Potential Recycled Water Demand	Future Recycled Water Demand	Total
Agriculture	1,495	0	1,495
Industrial	110	0	110
Landscape	1,181	2,157	3,338
<i>Total</i>	2,786	2,157	4,943
<i>Source: Western 2009.</i>			

Table 5-5
Estimates of Recycled Water Demand by Customer Type - Western Retail Area

Year	2015	2020	2025	2030	2035
Projected Recycled Water Production	1,500	1,500	3,000	4,000	4,000
Projected Recycled Water Demand	1,890	2,700	3,510	4,943	4,943

Western has been working with new developments in the retail area to ensure that recycled water can be used to the fullest extent possible. One major commercial area (Meridian Business Center) and one large residential community already are dual-piped for recycled water use and a new Riverside Unified School District (RUSD) high school has been retrofitted to allow recycled water use. Two new large residential projects (including a golf course development) will be conditioned to install dual plumbing. Western will continue also will work with the Riverside Unified School District to dual plumb new campuses.

Plan for Optimizing the Use of Recycled Water

In addition to preparation of the Recycled Water Master Plan, Western is working closely with other agencies in both its retail and wholesale service areas to identify and implement projects to optimize recycled water use:

- Western and the City of Riverside are currently conducting joint planning for recycled water use. The intent is to allow maximum use of recycled/non-potable water in the City of Riverside’s greenbelt area that will take advantage of elevation differences, thus reducing energy (pumping) costs. The system also will distribute non-potable groundwater through the legacy canal system thereby maximizing use of local water resources.
- Western is working with the Riverside County Ben Clark Training Center to site a large recycled water storage impoundment on their facility

located just south of Van Buren Boulevard and west of I-215. This proposed 600 AF impoundment would serve the County as a dive/water training facility while providing wet weather storage for recycled water produced by the Western Water Recycling Facility, a truly unique and innovative use of recycled water.

- Western is in the early stages of evaluating the use of recycled water to recharge local groundwater basins as a new source of supply. As total summer irrigation demands likely will exceed recycled water supply, recharge will probably be limited to winter months. Close coordination with the Regional Board and California Department of Public Health will be required.

References

SAWPA (Santa Ana Watershed Project Authority). 2010. One Water One Watershed 2009 Santa Ana Integrated Watershed Plan. November.

Western (Western Municipal Water District). 2009. Recycled Water Master Plan. December.